

EMR and Health

Quarterly report on electromagnetic radiation, health and well-being

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Australian government gears up for 5G

The Australian government has made changes to legislation that will facilitate the installation of 5G antennas in residential areas.

On 1 March Minister for Communications and the Arts Mitch Fifield announced changes to two pieces of telecommunications legislation that will facilitate carriers in installing 5th generation antennas in residential areas.

The changes were made to legislation relevant to the siting of mobile phone infrastructure: the *Telecommunications Code of Practice 1997* and *The Telecommunications (Low-impact Facilities) Determination 1997*. The Low-Impact Facilities (LIF) Determination lists equipment classified as exempt from local and state planning regulations.

The changes follow a consultation process from 9 June to 21 July last year in which stakeholders were invited to comment on 24 proposed changes to the legislation.

Following the consultation process, the Minister decided to implement nine of the proposed changes, increasing the number of facilities that can be classified as 'low-impact'. A summary of these can be found at <https://www.communications.gov.au/have-your-say/consultation-possible-amendments-telecommunications-carrier-powers-and-immunities>.

The two changes that will make 5G antennas immune from state and local government planning are the following:



1. 'Omnidirectional antennas: Specifies omnidirectional radiocommunications antennas as low-impact facilities in residential and commercial areas, not just industrial and rural areas.'

2. 'Radiocommunications facilities: Replaces the technology-specific term 'microcell' with general language to cover facilities with broader geographical coverage'

According to the Department's Carrier Powers and Immunities Team, the changes will 'give carriers greater flexibility to improve mobile and wireless broadband coverage for customers using a wider variety of small radiocommunications facilities, without the need for state and territory planning approvals.'

The Team further stated that 'It is expected that omnidirectional antennas and radiocommunications facilities will be deployed by carriers to deliver current and future mobile services, including fifth generation (5G) networks.'

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(Continued from page 1)

In other words, carriers will be able to install radiating-emitting infrastructure outside people's homes and workplaces and there will be nothing that councils, state governments or the community can do about it.

As justification for the Department's decision, the Team said, 'Omnidirectional antennas are thinner and considered to be less visually intrusive than panel or yagi antennas.' In other words, the decision has been based on the appearance of the antennas and not the radiation they emit.

EMR Australia argued in its submission to the Department in June, 'It is inappropriate, and contrary to planning practice, to classify 'low impact facilities' on the basis of size or height. Rather, they should be classified according to emissions of radiofrequency radiation.' Clearly these comments fell on deaf ears.

The legislative changes reflect a clever strategy. 5G antennas will serve smaller cells and will be located closer together than earlier generations of technology. It's expected that carriers will install them to existing infrastructure—such as light poles or awnings—without the need to construct large monopoles.

Nor is this the end of the story. The Minister announced that he will continue consulting on the other proposed changes, which may well find their way into legislation.

Ironically, these legislative changes come at a time when questions are already being asked about the safety of 5G technologies. The millimetre waves it is planned to emit can alter the expression of genes, increase the proliferation of cells, contribute to oxidative stress and inflammation, cause eye damage and affect the neuro-muscular system (see page 7).

On 13 September last year, over 180 scientists endorsed a letter to the European Union, urging it 'To take all reasonable measures to halt the 5G RF-EMF expansion until independent scientists can assure that 5G and the total radiation levels caused by RF-EMF (5G together with 2G, 3G, 4G, and WiFi) will not be harmful for EU-citizens, especially infants, children and pregnant women, as well as the environment.' (*EMR and Health* 13(4), 2017)

On the basis of existing evidence, some researchers are already calling for radiofrequency radiation to be classified as a Class 1 carcinogen (pages 4 and 7).

'carriers will be able to install radiating-emitting infrastructure outside people's homes and workplaces and there will be nothing state governments, councils or the community can do about it.'

5G spectrum

On 8 March the Turnbull Government announced that it would be making available spectrum for 5G telecommunications services.

Communications Minister Mitch Fifield issued a declaration requiring that the 3.6 GHz frequency band be reallocated from existing services (such as satellite service earth stations and point-to-point links) so that it can be used for 5G technologies. The reallocation period ranges from 2 years in most capital cities to seven years in regional Australia. Additionally, over 100 MHz of spectrum in the 3.6 frequency band will be auctioned.

The Australian Communications and Media Authority (ACMA) is also proposing to prepare licences for the use of the 5.6 GHz band for 5G.

The spectrum auctions are expected to take place in October.

(Media Release, 'Government approves auction process for 5G spectrum', 8.3.18.)

Mobile phones, cancer and health

The results of a major study by the National Toxicology Program show that mobile phone radiation produced carcinogenic changes in rats.

The results confirm and extend preliminary findings that were announced in May 2016, so concerned was the NTP about their implications. These showed that exposed animals had increased numbers of malignant glioma brain tumours and glial cell hyperplasia (which can lead to gliomas) and schwannomas (tumours) and hyperplasia of the heart. The authors wrote, 'given the widespread global usage of mobile communications among users of all ages, even a very small increase in the incidence of disease resulting from exposure to RFR could have broad implications for public health.' At that time, Associate Director of the NTP, Dr John Buchner drew attention to parallels between the findings of glial and schwann cell tumours in the study and in epidemiological studies on humans (see *EMR and health* 12(3), 2016).

In February, the US National Toxicology Project released the full draft report with the results of experiments conducted on both rats and mice.

Rats were exposed to a 900 MHz GSM signal before and after birth for 28 days or two years. Rats exposed for two years showed evidence of:

- malignant schwannomas (tumours) of the heart (males)
- adenomas or carcinomas in the prostate gland (males)
- malignant gliomas and benign or malignant granular cell tumours in the brain (males)
- adenomas in the pituitary gland (males)
- pheochromocytomas in the adrenal medulla (males)
- adenomas or carcinomas of the pancreatic islet (males)
- nonneoplastic lesions in the brain, heart, thyroid and adrenal gland (females)
- DNA damage.

Mice were exposed to mobile phone radiation of 1900 MHz for up to two years. Those exposed for two years showed evidence of:

- malignant lymphomas of multiple organs (females)
- hepatoblastomas of the liver
- adenomas or carcinomas of the lung
- DNA damage.

The NTP's response to the findings of its own research has changed significantly in the past two years. Whereas in 2016, it spoke of the importance of its findings, in 2018 it has chosen to downplay them by labelling them 'equivocal'. In releasing its results the Agency said, 'The incidence of tumors, called malignant schwannomas, that were observed in the heart increased in male rats as they were exposed to increasing levels of RFR beyond the allowable cell phone emissions. Researchers also noted increases in an unusual pattern of cardiomyopathy, or damage to heart tissue, in exposed male and female rats. Overall, there was little indication of health problems in mice related to RFR.'

The reports also point out statistically significant increases in the number of rats and mice with tumors found in other organs at one or more of the exposure levels studied, including the brain, prostate gland, pituitary gland, adrenal gland, liver, and pancreas. However, the researchers determined that these were equivocal findings, meaning it was unclear if any of these tumor increases were related to RFR.'

NIEHS, <https://www.niehs.nih.gov/news/newsroom/releases/2018/february2/index.cfm>

Phone tower radiation and tumours

Italian researchers have shown that exposure to wireless radiation—of the sort emitted by a GSM mobile phone tower—resulted in tumours of the heart and brain in rats.

In a paper published recently in the journal *Environmental Research*, scientists from the Ramazzini Institute in Bologna, Italy, found evidence supporting the findings of the NTP study and reaffirming the carcinogenic potential of radiofrequency radiation.¹

Professor Fiorella Belpoggi (pictured) and her team exposed 2448 rats to a radiofrequency signal of 1.835 GHz and intensities of 5, 25 or 50 volts per metre (V/m) - typical of exposure to a GSM mobile phone base station. Male and female animals were exposed for 19 hours a day from before birth till death.

Begun in 2005, the Ramazzini study is the largest long-term study performed on rats to investigate the health effects of radiofrequency radiation. It used more animals than the NTP study (page 3) and a longer period of exposure.

The scientists found an increased rate of heart and brain tumours in the most-exposed animals.

- Males exposed to 50 V/m had a statistically significant increase in Schwannomas of the heart.
- Males and females exposed to 50 V/m had a nonstatistically-significant increase in Schwann cell hyperplasia (enlargement).
- Females exposed to 50 V/m had a nonstatistically-significant increase in malignant glial tumours.



Although the study has not been finalised, the Ramazzini team decided to release its findings at this stage because of the significance of their results. 'The fact that also a small increase of the incidence of tumours induced by the exposure to RFR could have great impact for public health,' they wrote.

All findings are consistent with those of the NTP study and with epidemiological studies on humans, strengthening the association between radiofrequency radiation and cancer.

'These experimental studies provide sufficient evidence to call for the re-evaluation of IARC conclusions regarding the carcinogenic potential of RFR in humans', the authors said.

'These experimental studies provide sufficient evidence to call for the re-evaluation of IARC conclusions regarding the carcinogenic potential of RFR in humans'

Other scientists agree.

Dr Magda Havaas, from Trent University in Canada, said, 'The time has come for IARC (International Agency for Research Cancer) and the WHO to reconsider its classification of radio frequency radiation and change it from a class 2B (possibly carcinogenic) to either a class 2A (probably carcinogenic) or a class 1 (carcinogenic to humans). These three large and well conducted rat studies (U.S. Air Force, NTP, and Ramazzini Institute); the many studies documenting the various mechanisms involved in RFR and cancer; and the epidemiological studies documenting cancers among cell phone users and among those living near cell phone, radar, and broadcast antennas clearly indicate that RFR is more than just a "possible" carcinogen.'²

The study has major implication for the continued roll-out of radiation emitting base stations, including the planned roll-out of 5G technologies.

References

1. Falcioni, L et al, 'Report of final results regarding brain and heart tumors in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission', *Environmental Research*, <https://doi.org/10.1016/j.envres.2018.01.037>, <https://www.sciencedirect.com/science/article/pii/S0013935118300367>
2. <http://www.magdahavas.com/rats-using-cell-phones-are-developing-tumours/>

Wireless radiation and glial cells

Studies suggest that radiofrequency (wireless) radiation's effects on glial cells could account for various health effects.

There's mounting evidence that glial cells may play a role in a range of health problems resulting from exposure to wireless radiation, ranging from tumours to neurodegenerative diseases.

Two of the largest and best-conducted studies on wireless radiation and health have just been published by the National Toxicology Program (page 3) and the Ramazzini Institute (page 4). Both showed that exposed rodents had increased rates of tumours of the glial cells (gliomas) in the brain and tumours of the Schwann cells (schwannomas) which are located throughout the peripheral nervous system (PNS).

Glial cells, the most abundant cells in the nervous system, surround nerves, protecting and insulating them. There are various types of glial cells, including Schwann cells of the PNS. Schwann cells envelop the long, thin projections of nerve cells called axons that communicate information via electrical impulses from the brain and spinal cord to the muscles and tissues of the body, rather like a telephone line. They help with the regeneration of PNS nerves and produce a number of growth factors.

Schwann cells also play an important role in the PNS by producing a fatty substance called myelin. We can think of myelin as a form of insulation that coats the axons, increasing their conductivity and thus the speed at which they transmit information. (Unmyelinated axons will still convey information—just not as efficiently.) Schwann cells produce myelin from fat molecules called lipids and most myelination takes place in the first few years of life. In the brain, myelin is produced by glial cells called oligodendrocytes.

New insight on Schwann cells

In a study published recently in *The Journal of Cell Biology*, Laura Montani showed just how Schwann cells produce myelin from lipids. She found that the cells draw approximately 50 percent of their lipids from food and manufacture the other 50 percent themselves. To do this, they require an enzyme known as fatty acid synthase (FASN). Montani found that mice who lacked the FASN enzyme had less myelin than normal, healthy mice and that this lack could not be rectified by giving them a fatty diet.¹

Wireless radiation and glial cells

The results of the NTP and Ramazzini studies show that glial cells and Schwann cells were affected by exposure to wireless radiation to the extent of developing tumours.

These results are consistent with studies on humans. Numerous studies show a link between long-term mobile phone use and gliomas (eg Coureau, G, 2014; Hardell, 2013; Wang, 2016) and there's some evidence of a link between mobile phone use and vestibular schwannomas (Moon et al, 2014).

Wireless radiation and myelin

There may also be a link between wireless radiation and demyelination. Professor Olle Johansson and Dr Mary Redmayne hypothesised that demyelination caused by exposure to wireless devices may account for the symptoms of electromagnetic hypersensitivity.²

Dr Louis Slesin, editor of *Microwave News*, believes such a link is possible. 'Suddenly, it seems, a more coherent picture of the human and animal RF-cancer data is emerging with tumors of Schwann and glial cells at its center. The implication is that instead of searching for consistency in RF's ability to cause cancer in specific organs, the emphasis should now be on specific cell types—beginning with Schwann cells in the periphery and glial cells in the brain.'

'a more coherent picture of the human and animal RF-cancer data is emerging with tumors of Schwann and glial cells at its center'

Dr Louis Slesin

1. Montani, L et al, 'De novo fatty acid synthesis by Schwann cells is essential for peripheral nervous system myelination', *J Cell Biol* 2018, doi 10.1083/jcb.201706010.
2. Johansson O, Redmayne M, 'Exacerbation of demyelinating syndrome after exposure to wireless modem with public hotspot', *Electromagn Biol Med*, 2016;35(4):393-7 and 'Could myelin damage from radiofrequency electromagnetic field exposure help explain the functional impairment electrohypersensitivity? A review of the evidence,' *J Toxicol Environ Health B Crit Rev*. 2014;17(5):247-58

Mobile phone recall

Orange has recalled 90,000 mobile phones for exceeding French regulatory radiation limits and it's likely more recalls will follow.

The company made the decision to recall the HAPI 30 mobile phone, manufactured by Mobiwire, because the phones exceeded the exposure limits of the French standard. Its limits for exposure to the trunk are 2 watts per kilo (W/kg) when measured a short distance from the phone, whereas the Hapi measured 2.1 W/kg on the back of the phone itself.

On April 6, the National Frequencies Agency (ANFR) issued a media release saying 'Pursuant to Article L43 11 bis of the Post and Electronic Communications Code, the ANFR has given notice on 22 January 2018 to the company Mobiwire to take all appropriate measures to put an end to the noncompliance of the equipment on the market as well as those already sold.'¹

The Hapi 30 is only one of the many phones sold in France that fails to comply with the standard. The results of tests of other mobile phones listed on the ANFR website shows that many exceeded SAR limits, with some measurements as high as 7 W/kg.² So it's likely that more recalls will occur.

The recall demonstrates that not all mobile phones on the market comply with regulatory limits and provides additional justification for taking precautions to reduce exposure.

1. <https://www.anfr.fr/toutes-les-actualites/actualites/telephone-orange-hapi-30/#menu2>; 2. <https://data.anfr.fr/explore/dataset/das-telephonie-mobile/?disjunctive.marque&disjunctive.modele>

'The recall demonstrates that not all mobile phones on the market comply with regulatory limits and provides additional justification for taking precautions to reduce exposure.'

Wireless technology and kids

A meeting of school principals has heard that children's use of wireless devices at night time is disrupting their sleep and having negative effects on mood. They observed increasing numbers of children being referred to psychologists. (<https://tenplay.com.au/channel-ten/the-project/top-stories-april-2018/kids-and-tech>)

Experts also say that young kids' use of wireless devices is interfering with the development of their fine motor skills, with the result that many are unable to hold and use a pencil when they start school and thus impeding their ability to learn to write. (<http://pittsburgh.cbslocal.com/2018/02/26/children-tech-pencil-writing/>)

School ban on smart phones

Blenneville National School in Ireland has introduced a ban on children's use of smart phones outside school hours. The 11-week trial ban, supported by parents, was introduced after parents and teachers discovered 11- and 12-year-old children participating in social media groups where inappropriate content was being circulated.

Just a few days into the ban, parents reported that their children's behaviour and mood had improved and said they noticed that children were participating in more social activities. (*Independent* (Ireland) 30.04.18.)

RESEARCH UPDATES

RF/wireless radiation

Does 5G wireless radiation cause health problems?

According to A Di Ciaula, research shows that existing wireless technologies increase oxidative stress, by which they could contribute to cancer and affect reproductive, metabolic and neurological systems. They have been classified as Class 2B carcinogens. Millimetre waves emitted from 5G technologies have been shown to elevate skin temperature, alter the expression of genes, increase cell proliferation (associated with cancer), and impact on oxidative stress, inflammation and metabolism. They could cause eye damage and neuro-muscular effects. The author recommends taking precautions and revising exposure standards. (Di Ciaula, A, *Int J Hyg Environ Health*, Feb 2, 2018.)

Military staff exposed to high levels of radiofrequency radiation had increased rates of cancer.

Servicemen from four cohorts, who were most exposed to radiofrequency radiation had higher levels of hematolymphatic cancers than less exposed servicemen. The Israeli research team concluded that exposure increased the risk of cancer, that the evidence was sufficient to state it *causes* cancer and that compliance with international limits does not guarantee safety. Based on the results of their study and from research linking mobile phone use with increased rates of brain tumours, the authors wrote, 'We endorse Hardell's call for classifying this exposure as an IARC group 1 carcinogen and for updating the exposure standards.' (Peleg, M et al, *Environ Res* 163:123-133, May 2018.)

WiFi radiation damages sperm.

Researchers from China exposed healthy sperm to WiFi radiation and observed that it caused oxidative stress. Treating sperm with Trolox, a form of the antioxidant Vitamin E, reduced sperm damage. (Ding, S et al, *Chinese Medical J*, 131:4, Feb 2018.)

WiFi radiation damages the brain.

Scientists from India exposed rats to a 2.45 GHz WiFi signal for four hours a day for 45 days and subjected them to a battery of tests on behaviour, learning and memory. They concluded that exposure 'caused detrimental changes in rat brain leading to learning and memory decline and expression of anxiety behaviour along with fall in brain antioxidants.' (Varghese, R et al, *Pathophysiology* 25:19-30, 2018.)

Wireless headsets may pose a risk.

Wireless headsets, sometimes worn by medical practitioners, transmit information from computerised glasses. They can expose wearers to more radiation than from mobile phones—and mobile phone radiation has been linked to glioma and acoustic neuroma brain tumours. Wearing wireless glasses could impair the cognitive performance of medical staff and increase the risk of medical records being hacked, the authors wrote. (Sage, C and Hardell, L, *Electromag Biol Med* Feb 5:1-5, 2018.)

The skin is affected by 5G radiation.

In a paper to be published in May, Israeli scientists described the sweat duct in the upper layers of the skin as a helical antenna for frequencies in the sub-Terahertz range, such as those planned for 5G. It could, they suggested, lead to high radiation absorption rates (SARs). The authors concluded, 'we are raising a warning flag against the unrestricted use of sub-THz technologies for communication, before the possible consequences for public health are explored.' (Betzalel, N et al, *Environ Res*, 163:208-216, 2018.)



'Mobile phone radiation had a harmful effect on reproductive function in male rats'

Abbreviations

RF radiofrequency radiation (including mobile technology)

ELF extra-low frequency radiation (including electrical sources)

EMF electromagnetic fields (often used alternatively for ELF)

mG milliGauss (measurement of magnetic field)

T Tesla - alternative measurement of magnetic field; also milliTesla (mT) and microTesla (μ T)

0.1 mT = 1000 mG

0.01 mT = 100 mG

1 μ T = 10 mG

Hz Hertz - a measure of frequency (cycles per second).

Megahertz (MHz) - million Hz

GigaHertz (GHz) thousand million hertz

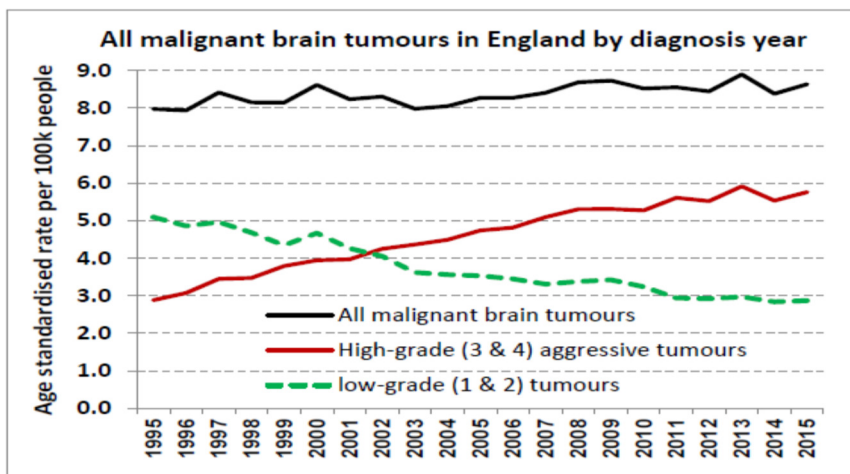
Brain tumour rise

Brain tumours are on the rise in England and the greatest increases are being found on the part of the head where people hold their mobile phones.

UK researchers investigated the question of whether there has been an increase in malignant brain tumours since 1995, using data from the UK Office of National Statistics.¹

For the years 1995 to 2015, they found 'a large and highly statistically significant increase' in the numbers of cases of glioblastoma multiforme (GBM), an aggressive brain tumour that usually claims lives quickly after diagnosis. During the period under investigation, the incidence rose from 983 to 2531 cases annually.

Most increases in the tumours were observed in the frontal and temporal lobes and in people aged over 55 years.



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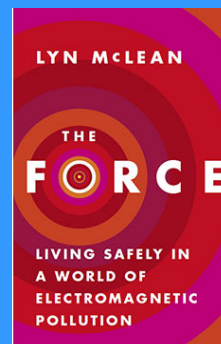
The increased incidence of GBM was not explained by improved diagnosis or genetic background and the authors suggested that 'widespread environmental or lifestyle factors may be responsible.'

Once such lifestyle factor may be the use of mobile phones, says Dr Lennart Hardell, commenting on the findings. 'The increasing incidence is most pronounced for GBM in temporal or frontal parts of the brain. That is parts with highest exposure to radiofrequency radiation from the handheld wireless phone.'

Hardell is author of a number of studies showing an association between mobile and cordless phone use and brain tumours, including one which found decreased survival rate in people with GBM who used mobile or cordless phones.³

1. Philips, A et al, 'Brain tumours: rise in Glioblastoma Multiforme incidence in England 1995–2015 suggests an adverse environmental or lifestyle factor', *J Environmental and Public Health*, <https://www.hindawi.com/journals/jep/h/aip/7910754/>
2. Professor Lennart Hardell, <https://lennarthardellenglish.wordpress.com/category/malignant-brain-tumour/>

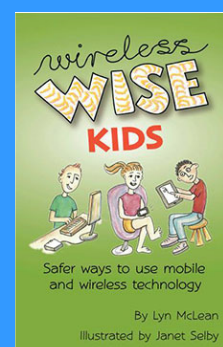
Books by Lyn McLean



'The Force'



'Wireless-wise Families'



'Wireless-wise Kids'

for everything you need to know about keeping your family EMR-safe
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Schools ban phones

McKinnon Secondary College, a state school in Melbourne, has banned the use of mobile phones in class—at the request of students.

From the beginning of the school year, students have been required to keep their mobile phones in their lockers during the school day to avoid being distracted by them in class. Principal Pitsa Binnon said she was surprised at how many messages students were receiving on their phones before the ban was implemented, often from their parents. After the ban, she noticed increased levels of noise in the playground, as students interacted with each other socially.

Deborah Harman, Principal of Balwyn High School, said that banning mobile phones at her school had the result of increasing student participation in school activities.

<https://www.theage.com.au/national/victoria/noise-levels-dialled-up-as-school-s-total-phone-ban-gets-kids-talking-20180220-p4z0zq.html>

WiFi in schools

How much radiation do students and teachers receive in classrooms with wireless routers and devices? To answer this question, Swedish scientists measured exposures of 18 teachers from seven schools, wearing radiation monitors for up to four days.

They found that measurements varied according to what equipment was being used at any time. Average exposure was from 1.1 to 61.1 $\mu\text{W}/\text{m}^2$. Higher levels (up to 396.6 $\mu\text{W}/\text{m}^2$) were measured when students watched YouTube clips. Peaks of 82,857 $\mu\text{W}/\text{m}^2$ were measured from mobile phone uplinks.

While these levels easily comply with international standards for short-term exposure, they are above levels at which many people report unpleasant symptoms (50 $\mu\text{W}/\text{m}^2$ in some cases and above precautionary levels of 5 $\mu\text{W}/\text{m}^2$ recommended by scientists in the Bioinitiative Report.

The authors suggested a number of strategies that could be implemented in schools to reduce exposure to teachers and students.

Hedendahl, LK et al, *Front Public Health* 20.11.2017; <https://doi.org/10.3389/fpubh.2017.00279>

ICT footprint

What impact do Information and Communications technologies have on the environment? To answer that question, scientists from Canada investigated the global footprint of these industries, taking into account consumer devices and the infrastructure that supports them, and compared it to total global greenhouse gas emissions.

The analysis revealed some surprising results. The scientists found ICT technologies contributed 1—1.6 percent of global greenhouse gas emissions in 2017. However, they calculated it could reach 14 percent by 2040—half the current greenhouse gas emissions of the transport industry. The authors also found that, by 2020, smart phones may generate more greenhouse gas emissions than emitted by desktops, laptops and other displays. 85% of their emissions come from production.

Lotfi Belkhir and Ahmed Elmeligi, 'Assessing ICT global emissions footprint: Trends to 2040 & recommendations', *Journal of Cleaner Production*, Vol 177, pp 448-463, 10 March 2018)

'banning mobile phones at school had the result of increasing student participation in school activities'



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Telstra's 5G innovations

Australian telecommunications giant Telstra opened a 5G Innovation Centre on the Gold Coast in February. The Centre is part of a \$60 million investment to upgrade telecommunications infrastructure on the Gold Coast in preparation for the rollout of fifth generation networks.

Chief Operations Officer, Robyn Denholm, said Telstra had established the Centre to ensure Australia is among the first countries in the world to gain access to 5G.

5G technologies will provide greater connectivity than any previous generation of wireless technologies, supporting the IoT (Internet of Things), in which devices and appliances connect with each other. 'More sophisticated applications will be possible,' Ms Denholm said, 'such as drone swarms and autonomous drones that can communicate and adjust behaviour based on real-time data inputs.'

(Telstra, Media release, 05.01.2018.)

Wanted: technology consultants

Many households are deactivating their radiation-emitting technologies—smart TVs, Wi-Fi internet and cordless phone connections and implementing safer wired connections instead. Some families are looking for consultants who can help with this process.

EMR Australia has begun a list of consultants who can provide this service at: <http://www.emraustralia.com.au/emr-solutions/wifi>

If you are able to and would like to provide this service, please contact EMR Australia with your details, including the area in which you work.

Satellites for internet

If these companies have their way, satellites will soon orbit Earth, delivering 5G-like electromagnetic signals across the globe.

Elon Musk's company SpaceX is testing two satellites before launching a constellation of 4425 satellites that will orbit at 1100 km above Earth in 2019. It has plans for another 7,518 satellites to follow—which will orbit at 321 km.

Other satellite constellations are being planned by OneWeb for 2019, Telesat and Boeing. (<https://www.cnn.com/2018/02/17/spacex-testing-its-own-satellite-broadband-internet-network.html>)

Radiation conference, Melbourne

The 5th Asian & Oceanic IRPA Regional Congress on Radiation Protection is being held in Melbourne from 20 -23 May, covering topics on both ionising and nonionising radiation. Presentations include talks by Professor Dariusz Lezczynski and Dr Victor Leech of ORSAA. The program and registration details are available at: <http://www.aocrp-5.org/congress-program>.

Mobile phone protection Blocsock mobile phone



pouches block 96%
radiation



Wavewall mobile phone
cases protect the head,
body and the phone



Pro Tubez airtube
headsets - latest
generation of airtube
headsets - keep the
phone away from the
head

Get Wi-Se!

With 5G just around the corner, you may be wondering how you can better protect yourself and your family from wireless radiation.

EMR Australia is pleased to announce that it is now producing the Wi-Se range of shielding garments that block radiofrequency radiation from mobile and cordless phones, Wi-Fi, 'smart' devices, base stations and other wireless sources.

They are perfect for everyone who uses a mobile phone, spends time on a computer or tablet or has Wi-Fi at home or work. And they are ideal for children who spend time in Wi-Fied classrooms.

The new Wi-Se singlet tops can be worn as they are or underneath other clothing. The design is perfect for Australian conditions.

The garments are made in Australia of laboratory-tested shielding fabric containing cotton and polyamide and reflective silver thread. The silver thread gives the fabric its protective properties and is also antibacterial.

Unlike some shielding fabrics that are coated in silver, the silver in the Wi-Se garments does not wash off during laundering.

The W-Se garments are currently available in sizes 8—16 for women and 6—12 for children. Sizes have been determined after washing, thus allowing for shrinkage.

EMR Australia plans to expand the range in the near future, including producing singlets for men.

Why protect yourself and your kids from wireless radiation?

Studies show that exposure to wireless radiation has

- increased risk of brain tumours
- caused chemical and structural changes in brains
- increased behaviour problems & ADHD-like symptoms in kids
- increased oxidative stress causing free radical damage
- damaged cells, hormones and DNA.

You can see more at: <http://www.emraustralia.com.au/shop/protection-shielding/wi-se-shielding-singlet-for-women>

Make the Wi-Se decision. Choose clothing that protects



Smart devices expose people to wireless radiation.

Wi-Se people protect themselves.

Tribute to a special man

It is with deep sadness that I write of the death of a very special man, who played an important role in creating public awareness about the health effects of electromagnetic radiation.

Robert Daniel (RD) Walshe, died on 6 March, aged 94. He was a prolific author, an educator, environmentalist and tireless campaigner for social justice. Bob founded Sydney's Total Environment Centre in the 1970s and the Sutherland Shire Environment Centre (SSEC) in 1991. In his later years, he spearheaded a campaign to have the Royal National Park—the world's oldest national park—listed on the World Heritage register, a campaign that is continuing.

Bob received an order of Australia medal and was twice named Citizen of the Year by Sutherland Shire Council (1995 and 2010).

In his role as Chairman of the SSEC, Bob lent unstinting support to the fledgling EMR Alliance of Australia, which later became the EMR Association of Australia (EMRAA). These organisations played a key role in raising awareness about electromagnetic radiation from the mid 1990s. They published a quarterly newsletter, gave talks, wrote articles and submissions, participated in standards-setting committees, provided evidence to Senate Inquiries and answered countless phone enquiries.

Bob is an inspiration, not just for his tireless work for the social and ecological betterment of our world, but for the alliances he forged, the friends he made and his generous and humble spirit. He will be long remembered.



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